CLAIMS

1. A rectangular microwave applicator operating at a predetermined operating frequency, having first (y) and second (x) transverse dimensions and a longitudinal (z) dimension, characterized in that said dimensions are selected, in relation to said predetermined operating frequency, such that the applicator supports a first evanescent $TEy_{m;1}$ hybrid mode and a second propagating $TEy_{m-2k;1}$ hybrid mode, where *m* is an odd integer larger than 1 (*m*=3, 5, 7, etc.) and *k* is a positive integer (*k*=1, 2, 3, etc.), and where *m-2k* is positive.

2. An applicator as claimed in claim 1, wherein the evanescent mode has a decay distance approximately equal to the longitudinal (z) dimension of the applicator.

3. An applicator as claimed in claim 1, comprising two parallel feeding slots arranged in the ceiling of the applicator, connecting the applicator to a feeding waveguide.

4. An applicator as claimed in claim 3, wherein the feeding waveguide is a TE_{10} waveguide.

5. An applicator as claimed in claim 4, wherein each of the slots has the dimension 60x12 mm adapted for operation at the ISM frequency of 2450 MHz.

6. An applicator as claimed in claim 3, 4 or 5, further comprising a metal post arranged centrally in the waveguide between the feeding slots.

7. An applicator as claimed in claim 6, wherein the dimensions of said metal post are 10x20x12 mm in the x-, y- and z-directions adapted for operation at the ISM frequency of 2450 MHz.

8. An applicator as claimed in any one of the preceding claims, comprising at least two metal rods or plates extending between opposite applicator walls.

9. An applicator as claimed in any one of the preceding claims, comprising means for reducing unwanted

propagation of LSM modes beneath a load placed under the applicator.

10. An applicator as claimed in claim 9, wherein said means for reducing unwanted propagation of LSM modes comprises a corrugated metal plate or metal profiles.

11. An applicator as claimed in claim 10, wherein said corrugated metal plate or said metal profiles have a height of 7 to 15 mm adapted for operation at the ISM frequency of 2450 MHz.

12. An applicator as claimed in any one of the preceding claims, wherein the open end of the applicator is curved in a cylindrical shape.

13. A microwave heating arrangement, comprising at least two microwave applicators according to any one of the above claims, said at least two applicators being arranged opposite each other in order to heat a load placed between said applicators.

14. An arrangement as claimed in claim 13, wherein said at least two applicators are displaced sideways one quarter of the applicator wavelength.

15. A microwave heating arrangement, comprising a plurality of microwave applicators according to any one of claims 1 to 11, said applicators being arranged side by side in a cylindrical configuration.

16. An arrangement as claimed in claim 15, wherein each of the applicators has a cylindrically curved open end.